UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,375	03/31/2004	Edward K. Y. Jung	SE1-0011-US	1977

80118 7590 03/09/2010

Constellation Law Group, PLLC
P.O. Box 220
Tracyton, WA 98393

EXAMINER	
SURVILLO, OLEG	
ART UNIT	PAPER NUMBER
2442	
MAIL DATE	DELIVERY MODE
03/09/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,375	JUNG ET AL.	
	Examiner	Art Unit	
	OLEG SURVILLO	2442	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/17/09; 08/28/09; 12/18/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-50 remain pending in the application. Claims 2, 11, 21, 33-35, and 42 are currently amended. No claims have been canceled. Claims 46-50 are new. It is noted that applicant's status of claim amendments at page 17 of reply is incorrect.

Response to Arguments

2. With regard to the applicants' remarks dated December 14, 2009:

regarding the rejection of claims 21-40 under 35 U.S.C. 112, first paragraph, applicants' arguments have been fully considered. As to claim 21, applicant stated that *"applicant has amended claim 21 to include one "means" recitation and an index creation agent that may be performed by different structures"*. See page 68 of response. However, applicant fails to provide any support in the specification where such "different structures" are described. Therefore, applicant's argument amounts to a general allegation. The rejection under 35 U.S.C. 112, first paragraph is maintained.

Regarding the rejection of claims 12, 13, 21-40, 32, 33, and 43 under 35 U.S.C. 112, second paragraph, applicants' arguments have been fully considered.

As to claims 12, 13, 32, and 33, applicants' amendment to remove "in response to said determining" from the preamble of each of claims 12, 13, 32, and 33 is not sufficient to overcome the rejection, as the step of creating is still claimed to occur after step of determining, as per corresponding independent claims.

As to claim 41, applicants' amendment has been fully considered and is sufficient. Therefore, the rejection has been withdrawn.

As to claim 43, applicants argued that *"the "index creation agent" may not properly be viewed as being limited to a software program as the Examiner suggests"*, in light of the specification at last paragraph of page 8. Examiner disagrees as specification fails to cover any other embodiments where the index creation agent would be specifically implemented in hardware. Applicants further argued that *"in other implementations, index creation agent 202 is not a computer program"*. In response to this argument it is noted that applicants' cited last paragraph of page 39 of the specification does not mention the claimed "index creation agent". Therefore, page 39 cannot be relied on to support the allegation that claimed "index creation agent" includes hardware such as ASICs, FPGAs, DSPs, etc. Since the only implementation of the index creation agent as supported by the specification is a software program, it is unclear how such program may comprise a processor. Therefore, the rejection is maintained.

Regarding the rejection of claims 1-50 under 35 U.S.C. 103(a), applicant's arguments have been fully considered but they are not persuasive.

As to claims 1, 21, 35, 41, and 45, applicants presented analogous arguments as those already fully addressed by examiner in the last Office action. Therefore, examiner's response to applicant's arguments is incorporated by reference and is not repeated for the sake of brevity.

As to any arguments not specifically addressed, they are the same as those discussed above.

Information Disclosure Statement

3. The information disclosure statements dated June 17, 2009 and December 18, 2009 fail to comply with the provisions of 37 CFR 1.98 and MPEP § 609 because documents listed under section U.S. Patent Application Documents are not identified by a U.S. Patent Application Publication Number, as required by column heading. As a result, these documents have not been considered.

Specification

4. The application contains disclosure entirely outside the bounds of the claims. Applicant is required to modify the brief summary of the invention and restrict the descriptive matter so as to be in harmony with the claims (MPEP § 1302.01).
In particular, it appears that only disclosure of section I. MOTE-ASSOCIATED INDEX CREATION (pages 6-11 of the specification) is relevant to the subject matter of claims 1-50, as presently claimed. The rest of the specification (pages 12-38) describes the subject matter of the co-pending applications wherein the name of each section in the specification corresponds to the name of each of the co-pending applications.
Applicants are reminded that the subject matter of the later sections of the specification (sections II. through V.) is actually included through their incorporation by reference of the related/parent applications, as mentioned in the beginning of the specification

(pages 1-4). As a result, providing a detailed description of the subject matter of co-pending applications is redundant and must be removed from the current application.

This objection was requested by applicants to be held in abeyance until allowable subject matter is indicated, pursuant to 37 CFR 1.111(b), in response dated November 26, 2008.

5. The specification is objected to under 37 CFR 1.75(d)(1) as failing to provide a clear support or antecedent basis in the description for amended claims, as discussed below with respect to the written description requirement.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 2, 21-40, and 47-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

As to claim 2, the limitation of "said determining at least one of a sensing function or a control function at a first mote of a second mote further comprises accessing at least one device entity registry of the second mote, wherein the device entity registry

includes a network address of the second mote" fails to be described in the specification. In particular, it is nowhere described that determining at the first mote comprises accessing a device registry of the second mote. What specification does describe is determining includes accessing a device registry of a mote by the index creation agent residing within the mote. See last paragraph at page 9.

As to claim 21, limitation of *"an index creation agent including means for creating"* fails to be described in the specification such that claimed structure can be ascertained. In particular, as discussed fully in the last Office action, for every "means plus function" limitation, the current specification must be reviewed to assist in identifying the corresponding structure that performs the claimed function. The specification shows that determining at least one of a sensing function or a control function at a mote and creating one or more mote-addressed content indexes in response to said determining is performed by an index creation agent (202) (bottom of page 9, page 10). Therefore, means for determining are an index creation agent (202), and means for creating are also an index creation agent (202).

Thus, according to currently amended claim 21, an index creation agent includes an index creation agent for creating one or more mote-addressed content indexes. Such structure was nowhere mentioned in the disclosure. Applicants are required to either provide a proper antecedent basis in the specification for the claimed subject matter, identify alternative structure corresponding to the claimed function of "creating one or more mote-addressed content indexes", or amend the claim to comply with the written description requirement.

Claim 21 further recites in part *"wherein at least one of the means for determining or the means for creating includes hardware for at least one of determining or creating"*. The cited page 40 of the specification provides a very generic description of "electrical circuitry" and how *"those skilled in the art will recognize that the various aspects described herein which can be implemented, individually and/or collectively, by a wide range of hardware, software, firmware, or any combination thereof can be viewed as being composed of various types of "electrical circuitry""*. Such broad statement, applicable to virtually any computer-related patent application, provided at pages 39-43 of the specification, such section describing "the state of the art" in the computer-related field, fails to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had possession of the claimed invention directed to, in part, hardware for at least one of determining at least one of a sensing function or a control function of a second mote at a first mote or creating one or more mote-addressed content indexes of the second mote at the first mote in response to said determining. It is nowhere described or even mentioned in the 43-page specification that claimed "hardware" is specifically for at least one of determining or creating, as claimed.

As to claims 47 and 48, the limitation of "updating the mote-addressed content index to indicate availability of information from a sensing device information" (emphasis added) was not described in the specification. Applicants are required to either provide

a proper antecedent basis in the specification for the claimed subject matter or amend the claims to comply with the written description requirement.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2, 12, 13, 21-40, 32, 33, 43, 46, and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 2, it is unclear which one of "at least one device entity" "**the** device entity" refers to.

As to claims 12 and 13 (and corresponding claims 32 and 33), the step of establishing an index-creating agent at the mote (as part of said creating step which occurs in response to said step of determining, as in claim 1) is ambiguous because the order of steps is unclear to the extent that it is inconsistent with the order provided in the specification. In particular, independent claim 1 (and independent claim 21) states that step of creating is performed after (in response to) step of determining. The body of the claim further limits the step of creating by introducing additional steps (establishing, determining, and associating). However, the step of establishing an index-creating agent at the mote in response to the step of determining is inconsistent with the specification. The specification shows at the bottom of page 9 and the top of page 10 that *"...index creation agent communicates with the device entities to find out what sensing functions are present and/or available at their various respectively associated*

devices…" Thus, the specification identifies an index-creating agent as performing the step of determining (recited in claims 1 and 21). In light of the specification, one of ordinary skill in the art would reasonably conclude that an index-creating agent is established prior to the step of determining in order for it to perform the step of determining. Therefore, the step of establishing an index-creating agent at the mote subsequently (in response to) step of determining, as currently claimed, is inconsistent with the specification and is, therefore, ambiguous.

Claim 13 contains analogous inconsistency wherein the step of migrating to the mote is claimed to be performed in response to the step of determining (recited in claims 1 and 21).

If applicants assert that the index creation agent does not perform the step of determining (of claims 1 and 21), as identified by examiner, the appropriate citation from the specification must be provided in the next response clearly indicating which component of the invention performs the recited step of determining.

As to claim 21, limitations: "means for determining" and "means for creating" are interpreted to invoke 35 USC 112, sixth paragraph.

The current specification must be reviewed to assist in identifying the corresponding structure that performs the claimed function. The specification shows that determining at least one of a sensing function or a control function at a mote and creating one or more mote-addressed content indexes in response to said determining is performed by an index creation agent (202) (bottom of page 9, page 10). Therefore,

means for determining are interpreted to be an index creation agent (202), and means for creating are also interpreted to be an index creation agent (202).

Since the index creation agent is a computer program, as evidenced by specification at page 8 last paragraph, it is unclear how can a computer program include hardware, as currently claimed. In their arguments, applicants failed to either rebut presumption that 35 U.S.C. 112, sixth paragraph applies or explain why the particular structure identified by examiner is not the correct structure identified by “means” in the claimed “mean-plus-function” language. Thus, the rejection is deemed proper.

As to claim 21, it is further unclear as to how an index creation agent can include an index creation agent, that is, itself.

Claims 22-40 are rejected for the same reasons as these claims depend from rejected claim 21.

As to claims 32 and 33, it is unclear how can an index creation agent comprise means for migrating and installing/establishing itself at the mote.

As to claim 43, an index creation agent is interpreted as a software program since it is the only implementation disclosed in the specification at last paragraph of page 8. The index creation agent being a software program, it is unclear how a software program may comprise a processor, which is clearly a hardware component.

As to claim 46, it is unclear as to what is the relation between "a sensing device" of claim 46 and a first (second) mote of claim 1.

As to claim 47, it is unclear how can the availability of information from a sensing device information be indicated.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 12, 14, 15, 18-21, 32, 34, 35, 38-42, 44-47, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751 A1) in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al.

As to claim 1, Mulgund teaches:

determining at least one of a sensing function or a control function of a second mote [discovering and maintaining the distributed sensor network topology (par. [0007]), wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

creating one or more mote-addressed content indexes of the second mote in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (par. 0007)].

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

Mulgund does not show that said determining and creating is being performed at a first mote.

Madden shows:

determining at least one of a sensing function or a control function at a first mote [parent mote] of a second mote [child mote] [asking sensors to choose the group they belong to forward tagged partial state record with the group id] (section 4.2 Grouping); and

creating one or more mote-addressed content indexes of the second mote at the first mote in response to said determining [creating in-network aggregate of collected information across all groups] (section 4.2 Grouping).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having said determining and creating being performed at a first mote in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

As to claims 12 and 32, Mulgund in view of Madden shows:

establishing an index-creating agent at the first mote [causing the network modeling agent to visit a first sensor node and mark the first node visited] (par. [0007] in

Mulgund) [installing TinyOS (mote operating system) and a generic aggregation service TAG] (section 1 Introduction in Madden);

determining a mote-network address of the second mote (paragraphs [0021] and [0028] – [0031] in Mulgund; section 2.1 Ad-Hoc Routing Algorithm in Madden); and

associating at the first mote at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index with the mote-network address of the second mote (Fig. 3 and par. [0037] in Mulgund; section 4.2 in Madden).

As to claims 14, 15, and 34, Mulgund in view of Madden shows:

determining a mote-network address of the second mote (paragraphs [0021] and [0028] – [0031] in Mulgund);

determining one or more types of control and sensing available from one or more devices at the second mote (paragraphs [0021] – [0024] in Mulgund) wherein the following data elements are obtained by interrogating a node (par. [0044] in Mulgund); and

associating the one or more types of control or sensing available from one or more devices at the second mote with the mote-network address of the second mote (Fig. 3 and par. [0037] in Mulgund).

As to claims 18-20 and 38-40, the claims will be interpreted broadly since the meaning of the claimed limitations is not understood.

As to claims 18-20 and 38-40, Mulgund shows associating one or more mote-appropriate routing addresses [note addresses (see table 20 of Fig. 3)] with at least one mote-addressed content index (Fig. 3 and Fig. 4, paragraphs [0037]-[0038]) wherein mote-addressed content index could be addressed directly or indirectly depending on the implementation (paragraph [0042]).

As to claim 21, Mulgund inherently shows:

means for determining at least one of a sensing function or a control function of a second mote [discovering and maintaining the distributed sensor network topology (par. [0007]), wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

an index creation agent including means for creating one or more mote-addressed content indexes of the second mote in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (par. 0007)], wherein at least one of the means for determining or means for creating includes hardware for at least one of determining or creating (par. [0026]).

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

Mulgund does not show that said determining and creating is being performed at a first mote.

Madden inherently shows:

means for determining at least one of a sensing function or a control function at a first mote [parent mote] of a second mote [child mote] [asking sensors to choose the group they belong to forward tagged partial state record with the group id] (section 4.2 Grouping); and

an index creation agent including means for creating one or more mote-addressed content indexes of the second mote at the first mote in response to said determining [creating in-network aggregate of collected information across all groups] (section 4.2 Grouping), wherein at least one of the means for determining or means for creating includes hardware for at least one of determining or creating (section 2 Motes and Ad-Hoc Networks).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund by having said determining and creating being performed at a first mote in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

As to claim 35, Mulgund in view of Madden shows:

means for determining a mote-network address of the second mote (paragraphs [0021] and [0028] – [0031] in Mulgund);

means for determining one or more types of control and sensing available from one or more devices at the second mote (paragraphs [0021] – [0024] in Mulgund)

wherein the following data elements are obtained by interrogating a node (par. [0044] in Mulgund); and

means for associating at the first mote (as taught by Madden per claim 21) in the one or more mote-addressed content indexes the one or more types of sensing available from one or more devices of the second mote with the mote-network address of the second mote (Fig. 3 and par. [0037] in Mulgund).

As to claim 41, Mulgund shows:

a first mote [node 2] (Fig. 1);

at least one mote-appropriate device [sensor 16] at a second mote [another node 2] (Fig. 2 and par. [0026]); and

at least one index creation agent [a sensor network modeling agent], said at least one index creation agent configured to create at least one of a sensing index, a control index, or a routing/spatial index associated with the second mote (Fig. 3 and par. [0037]).

Mulgund also shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (par. [0030]), which suggests that there exists some agent resident in a mote that collects data from sensors and stores it in the local knowledge base, however, the local agent per se is not explicitly shown.

Madden shows:

at least one index creation agent [generic aggregation service for ad hoc networks of TinyOS motes] resident in the first mote [parent mote], said at least one index creation agent configured to create at least one of a sensing index [group id index] associated with the second mote [child mote] [creating in-network aggregate of collected information across all groups] (section 4.2 Grouping).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having said at least one index creation agent being resident in the first mote in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

As to claim 42, Mulgund teaches that said at least one of a sensing index, a control index, or a routing/spatial index associated with the second mote further comprises information indicating availability of or format of data from at least one of a temperature device, light device, electrical/magnetic device, volume device, or inertial device at the second mote [interrogating a node to determine what type of information it provides, and then define the table structures accordingly] (par. [0042]).

As to claim 44, Mulgund shows at least one of a processor, a memory, or a communications devices formed from a substrate (par. [0026]).

As to claim 45, Mulgund shows:

a first mote [node 2] (Fig. 1);

at least one mote-appropriate device [sensor 16] at a second mote [another node 2] (Fig. 2 and par. [0026]); and

a mote-addressed content index having at least a sensing function of said at least one mote-appropriate device at the second mote (Fig. 3 par. [0037]).

Mulgund does not show that said mote-addressed content index is at the first mote.

Madden shows:

a mote-addressed content index at the first mote [parent mote] having at least a sensing function [group id] of said at least one mote-appropriate device at the second mote [child mote] [creating in-network aggregate of collected information across all groups] (section 4.2 Grouping).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having said mote-addressed content index being at the first mote in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

As to claim 46, Mulgund in view of Madden teaches that said determining at least one of a sensing function or a control function at a first mote of a second mote further comprises determining availability of information from a sensing device, determining a format of information obtained from the sensing device, determining a format of

commands to query the sensing device, or determining an output format of information from the queried sensing device [interrogating a node to determine what type of information it provides, and then define the table structures accordingly] (par. [0042] in Mulgund).

As to claim 47, Mulgund in view of Madden teaches updating the mote-addressed content index to indicate the availability of information from a sensing device information, the format of information obtained from the device, the format of commands to query the device, or the output format of information from the queried device [network modeling agent builds the database by updating relational database logical design tables at each step of the discovering step] (par. [0007] in Mulgund).

As to claim 49, Mulgund in view of Madden teaches creating the one or more mote-addressed content indexes indicating information pertaining to at least one of a sensing function or a control function of the second mote, as discussed above with respect to claims 1 and 21.

As to claim 50, Mulgund in view of Madden teaches that the information in the one or more mote-addressed content indexes pertains to at least one of a sensing function or a control function indicates an identification of a sensing device of the second mote (par. [0021] in Mulgund), and the availability of information from the sensing device, the format of information obtained from the sensing device, the format

of commands to query the sensing device, or the output format of information from the queried sensing device (par. [0042] in Mulgund).

12. Claims 2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claims 2 and 22, Mulgund in view of Madden shows all the elements except for accessing at least one device entity registry of the second mote, wherein the device entity registry includes a network address of the second mote.

Chiloyan teaches accessing at least one device entity registry [accessing memory of the peripheral device] (abstract, col. 3 lines 16-27 and 40-44), wherein the device entity registry includes a network address (col. 3 lines 16-27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by accessing at least one device entity registry of the second mote, wherein the device entity registry includes a network address of the second mote in order to enable communication between the host device and a remote device accessed at the network address (col. 3 lines 16-27 in Chiloyan).

13. Claims 3-6 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor

Networks" by Samuel Madden et al. and in further view of Godlewski (US Patent No.: 6,421,354).

As to claims 3 and 23, Mulgund in view of Madden shows communicating with at least one device at the second mote [asking sensors to choose the group they belong to forward tagged partial state record with the group id] (section 4.2 Grouping in Madden).

Mulgund in view of Madden does not expressly show that communication is established with at least one device-associated entity.

Godlewski shows communicating with at least one device-associated entity [a sensor interface] (Fig. 1 and Fig. 4) (col. 1 lines 45-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by communicating with at least one device-associated entity in order to receive data from a sensor in the appropriate format (col. 1 lines 45-55 in Godlewski).

As to claims 4 and 24, Mulgund in view of Madden and Godlewski shows communicating with at least a light device entity (col. 5 lines 58-67 and col. 6 lines 1-10 in Godlewski).

As to claims 5 and 25, Mulgund in view of Madden shows accessing at least one device identifier of a mote-addressed content index (section 2.1 Ad-Hoc Routing Algorithm in Madden).

As to claims 6 and 26, Mulgund in view of Madden and Godlewski shows communicating with at least one device entity using a common application protocol (Fig. 6 col. 13 lines 7-42 in Godlewski).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by communicating with at least one device entity using a common application protocol in order to transmit data from a sensor to the communicator using sensor interface software (col. 13 lines 35-42 in Godlewski).

14. Claims 7-11, 13, 27-31, 33, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. (hereinafter *Madden (TAG)*)and in further view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. (hereinafter *Madden (ACQP)*).

As to claims 7 and 27, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows creating at least one extensible index [a sensors table, which is conceptually unbounded (section 3.1 par. 3 in Madden (ACQP))].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden (TAG) by creating at least one extensible index in order to utilize the ability of TinyOS to select, join, project, and aggregate data (Madden (ACQP) at section 1 Introduction).

As to claims 8 and 28, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows creating the at least one extensible index in response to a type of content indexed [creating a sensors table in response to light and temperature readings selected as a type of content requested from sensors (section 3.1 par. 3 in Madden (ACQP))].

As to claims 9 and 29, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows creating at the first mote at least one a mote-addressed sensing index [a sensor table of sensors' readings (section 3.1 par. 3 in Madden (ACQP))].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden (TAG) by creating at the first mote at least one a mote-addressed sensing index in order to utilize the ability of TinyOS to select, join, project, and aggregate data (Madden (ACQP) at section 1 Introduction).

As to claims 10 and 30, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows creating at the first mote at least one of a mote-addressed routing/spatial index [a list of neighbors and some routing information about the connectivity of those neighbors to the rest of the network (section 2.2 Communication in Sensor Networks, par. 2 in Madden (ACQP))].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden (TAG) by creating at the first mote at least one of a mote-addressed routing/spatial index in order to utilize the ability of TinyOS to select, join, project, and aggregate data (Madden (ACQP) at section 1 Introduction).

As to claims 11 and 31, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows inserting at least one device identifier in the one or more mote-addressed content indexes and indicating at least one of: associated format of information of the second mote, a format of commands or availability of information of the second mote [nodeid that is selected to be reported in the sensors table and light and temperature readings] (section 3.1, see the first query).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden (TAG) by inserting at least one device identifier in the one or more mote-addressed content indexes and indicating at least one of: associated format of information of the second mote, a format of commands or availability of information of the second mote in order to utilize the ability of TinyOS to select, join, project, and aggregate data (Madden (ACQP) at section 1 Introduction).

As to claims 13 and 33, Mulgund shows:

migrating an index creation agent to the first mote [visiting a first sensor node with a network modeling agent] (par. [0007] lines 18-19); and

querying at least one device entity at the second mote with the index creation agent [interrogating another node with the network modeling agent] (par. [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (par. [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base, however, the management module per se is not explicitly shown.

Madden (TAG) inherently shows installing an index creation agent at the first mote (section 1.1 The TAG Approach).

Madden (ACQP) shows installing an index creation agent at the first mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, par. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by installing an index creation agent at the first mote in order to select, join, project, and aggregate data from the sensors in network (section 1 Introduction, paragraph 4 in Madden (ACQP)).

Claim 43 will be examined as best understood.

As to claim 43, Mulgund in view of Madden (TAG) and in further view of Madden (ACQP) shows a processor configured to obtain at least a sensing function of the mote (section 2.1 Properties of Sensor Devices, par. 2 in Madden (ACQP)).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Mulgund by having a processor in order to process sensor data that is being stored in a knowledge base (Fig. 2 in Mulgund).

15. Claims 16, 17, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. and in further view of Kung et al. (US 2005/0021724 A1).

As to claims 16 and 36, Mulgund shows:

determining a mote-network address of the second mote (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information related to devices of or proximate to the second mote with the mote-network address of the second mote (Fig. 3 and par. [0037]).

Mulgund in view of Madden does not show determining one or more types of spatial information related to devices of or proximate to the second mote.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (par. [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by determining one or more types of spatial information related to devices of or proximate to the second mote in order to determine a global position of a mote that would identify a location of the mote in space (par. [0010] in Kung).

As to claims 17 and 37, Mulgund in view of Madden shows:

determining a mote-network address of the second mote (paragraphs [0021] and [0028] – [0031] in Mulgund); and

associating at the first mote the one or more types of information of other motes proximate to the second mote with the mote-network address of the second mote (Fig. 3 and par. [0037] in Mulgund).

Mulgund in view of Madden does not show determining one or more types of absolute spatial information of other motes proximate to the second mote.

Kung shows determining one or more types of absolute spatial information of other motes proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by determining one or more types of absolute spatial information of other motes proximate to the second mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLEG SURVILLO whose telephone number is (571)272-9691. The examiner can normally be reached on M-Th 8:30am - 6:00pm; F 8:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on 571-272-4006. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Oleg Survillo

Phone: 571-272-9691

/Asad M Nawaz/
Primary Examiner, Art Unit 2455